

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

DN 50-344

REGION V

Report No. 81-12  
Docket No. 50-344 License No. NPF-1 Safeguards Group \_\_\_\_\_  
Licensee: Portland General Electric Company  
121 S. W. Salmon Street  
Portland, Oregon 97204

Facility Name: Trojan

Inspection at: Rainier, Oregon

Inspection conducted: May 11-15, 1981

Inspectors: E. M. Garcia 22 June 1981  
E. Garcia, Radiation Specialist Date Signed  
G. P. Yuhas 6-22-81  
G. P. Yuhas, Radiation Specialist Date Signed

Approved by: F. A. Wenslawski 6/22/81  
F. A. Wenslawski, Chief, Reactor Radiation Protection Section Date Signed

Approved by: F. A. Wenslawski 6/22/81  
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Summary:

Inspection on May 11-15, 1981 (Report No. 50-344/81-12)

Areas Inspected: Routine unannounced inspection by regional based inspectors of implementation of the radiation protection program during refueling conditions, activities associated with the packaging and shipment of radioactive materials, and followup to the 10 CFR 20.405 report submitted March 25, 1981 concerning exposure of an individual in excess of 1.25 rem in a calendar quarter without first completing a Form NRC-4. The inspection involved 86 hours onsite by two NRC inspectors.

Results: Of the areas inspected, one item of noncompliance was identified in each of the following areas: failure to limit an individual's quarterly exposure to 1.25 rem until his accumulated occupational dose had been determined, 10 CFR 20.101(a), Paragraph 2; failure of the PRB to review and approve procedures for control of radioactivity as required by Technical Specification 6.8, Paragraph 3; and failure to label containers of licensed material as required by 10 CFR 20.203(f), Paragraph 4.

## DETAILS

### 1. Persons Contacted

#### Portland General Electric (PGE) Personnel

- \*B. D. Withers, Vice President, Nuclear
- \*C. P. Yundt, General Manager, Trojan
- \*C. A. Olmstead, Manager Technical Services
- \*R. P. Barkhurst, Manager Operation and Maintenance
- \*J. D. Reid, Manager, Plant Services
- \*T. Meek, Radiation Protection Supervisor
- \*H. Sagen, Quality Assurance Supervisor
- \*G. Rich, Chemistry Supervisor
- \*R. E. Susee, Training Supervisor
- L. Larson, Unit Supervisor Radioactive Material Control
- V. Parola, Assistant Radiation Protection Supervisor

#### Non PGE Personnel

- \*H. Moomey, Oregon State Department of Energy Resident Engineer
- \*B. Dixon, Oregon State Department of Energy Nuclear Engineer
- L. Reynolds, Chem-Nuclear Systems Inc. by telephone

\*Denotes those individuals attending the exit interview on May 15, 1981.

In addition to the individuals noted above, the inspector met with and interviewed other members of the licensee's and contractor's staff.

### 2. Licensee Event Report

On March 25, 1981 the licensee submitted a report pursuant to 10 CFR 20.405(a) that one individual had been permitted to receive a whole body dose of 2.07 rem during the first calendar quarter of 1981 before Form NRC-4, "Occupational External Radiation Exposure History", was fully completed.

10 CFR 20.101(a) states that no licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from radioactive material and other sources of radiation a total occupational dose in excess of 1.25 rems whole body exposure. The licensee may permit an individual in a restricted area to receive whole body exposures not exceeding 3 rems per calendar quarter provided the individual's accumulated occupational dose has been determined and recorded on a Form NRC-4 (or an equivalent record) as authorized by 10 CFR 20.101(b).

In this case, the individual was hired in early February 1981 to assist in the steam generator repair activity. On February 3, 1981 the individual completed sections 1 thru 7 and 12 of Form NRC-4 indicating that he had received previous occupational exposure in 1976. The licensee submitted a request to the previous employer for verification of exposure history. The Trojan Nuclear Plant Holding File Form 15 was initiated as required by Radiation Protection Procedure, RP-109, "Personnel Dosimetry Procedure". The block on Form 15 indicating that the individual's exposure records were incomplete was checked, however the block limiting the individual's dose to less than 1.25 rem per quarter was not checked. On February 4, 1981 the dosimetry clerk completed the "Request to Increase Administrative Exposure Limits" Form 19 which would authorize the individual to receive 2.0 rem in the first calendar quarter. The clerk reviewed Form 15 but failed to realize that with incomplete exposure records the individual's exposure should have been limited to 1.25 rem. Information on Form 19 used by the Radiation Protection Supervisor and General Manager to grant approval of the increased exposure did not include a determination of the individual's accumulated occupational dose to the whole body or an assessment that the additional dose to the whole body when added to the accumulated occupational dose would not exceed  $5(N-18)$  rems where "N" is the individual's age in years. Form 19 was signed on February 4, 1981 authorizing an exposure of 2.0 rem. On February 6, 1981 the individual entered the "A" steam generator and received an exposure of 2.07 rem. Since this dose was slightly greater than 2.0 rem an "Exposure Investigation" was performed and documented on Form 17 as required by RP-109. This investigation form was signed by the Assistant Radiation Protection Supervisor on February 12 and by the Radiation Protection Supervisor on February 20, 1981. On February 23, 1981 the Radiation Protection Supervisor discovered during a routine review that this individual's exposure history was incomplete and initiated an investigation into the matter which resulted in the 10 CFR 20.405 report. On February 27, 1981 the licensee received verification of previous exposure. This previous dose (0.1 rem) when added to the 2.07 rem received clearly indicates the  $5(N-18)$  criterion was not violated. However, failure to limit the quarterly exposure to 1.25 rem until the licensee has determined the individual's accumulated occupational dose to the whole body on Form NRC-4, or on a clear and legible record containing all the information required in that form; and has otherwise complied with the requirements of 10 CFR 20.102 represents noncompliance with 10 CFR 20.101(a) (50-344/81-12-01).

The inspector confirmed by telephone that the individual had received reports of his exposure dated March 25 and April 21, 1981 as required by 10 CFR 20.409, "Notification and Reports to Individuals".

In the March 25, 1981 report the licensee presented three corrective actions to preclude recurrence of similar events. These actions were scheduled to be completed by May 1, 1981. The inspector reviewed Radiation Protection Procedure RP-109, "Personnel Dosimetry Program", Revision 6,

dated March 26, 1981. Forms 15, 19 and instructions for their use were revised to provide more specific guidance with respect to the 10 CFR 20.101 and 10 CFR 20.102(b) requirements. From discussions with the dosimetry clerks the inspector verified that they had all received retraining on Revision 6 of the procedure by May 1, 1981.

Based on the inspection effort described in Paragraph 4 of this report the corrective actions have been effective in preventing additional instances of noncompliance with the requirements of 10 CFR 20.101(a).

### 3. Transportation Activities

#### a. Management Controls

PGE Administrative Order AO-11-3, "Radioactive Waste Control", Revision 10, dated April 6, 1981 defines the responsibility and procedures for the administrative control of radioactive wastes. Plant supervisors are responsible for minimizing the generation of radioactive wastes and the Radiation Protection Supervisor is responsible for monitoring the generation of solid waste, recommending methods of minimizing volume, ensuring waste shipments are made in accordance with regulatory requirements, and reporting shipments of radioactive waste. The Trojan Nuclear Plant "Radiation Protection Manual", Revision 32, dated April 15, 1981 discusses radioactive material control in section II.E and references procedure RP-107, "Radioactive Material Receipt and Shipment" for specifics.

Revision 6 to the Nuclear Projects Quality Assurance Program for Operations incorporated Appendix 2C, "Quality Assurance and Administrative Controls for Packaging Radioactive Material For Transport" which describes which sections of the 10 CFR 50 Appendix B approved quality assurance plan will be applied to transportation activities.

In the licensee's November 26, 1980 response to Significant Appraisal Finding 3B of the NRC Health Physics Appraisal Inspection a new position of Radioactive Waste Supervisor was to be created and procedure OI-T-23 revised by January 1, 1981. Additionally, Trojan's radioactive material shipping procedures were to be revised to "provide further assurance" that all regulatory requirements would be complied with.

On January 1, 1981 a Chemical and Radiation Protection Technician (C&RPT) was promoted to the position of Unit Supervisor Radioactive Material Control (USRMC). Review of the Jobs Description dated February 11, 1981 for this position indicates the USRMC reports directly to the Radiation Protection Supervisor and is responsible for directing the activities of eight full time utility workers. The USRMC is responsible for the collection, packaging, shipment and receipt of radioactive materials. The inspector confirmed thru discussion with the USRMC that his four years of operating

reactor experience involving radiation protection and shipment of radioactive materials and three years of college chemistry meet the requirements specified in Technical Specification 6.3, "Facility Staff Qualifications".

The inspector reviewed the procedures listed below to determine if they have been developed consistent with the requirements of Technical Specification 6.8, 10 CFR 30, 10 CFR 71, 49 CFR 100-199 and the burial site criteria.

| <u>Procedure No.</u> | <u>Title</u>  | <u>Revision No.</u> |
|----------------------|---|---------------------|
| AO-2-2               | Review Responsibilities   | 5                   |
| AO-11-3              | Radioactive Waste Control   | 10                  |
| POM-Vol. 10          | Radiation Protection Manual   | 32                  |
| RP-107               | Radioactive Material Receipt and Shipment                                     | 7                   |
| RP-122               | Radiation Protection Professional Staff Training                              | 0                   |
| OI-T-13              | CVCS Mixed Bed Resin Transfer Directly to Train Bay                           | 2                   |
| OI-T-23              | East (west) Steam Generator Blowdown Resin Transfer Directly to Train Bay     | 4                   |
| OI-T-26              | CVCS Cation Resin Transfer Directly to Train Bay                              |                     |
| TRP-003              | Radioactive Waste Drumming  | 0                   |
| TRP-005              | Transfer of Material in and out of a Controlled Area                          | 0                   |
| TRP-006              | Dewatering Procedure for Resin Liners   | 0                   |
| TRP-007              | Handling Procedure for CNSI Cask G-80-2 Secondary Lid Removal and Replacement | 0                   |

Based on this review several observations were brought to the licensee's attention.

1. TRP-005 does not address documentation of survey results for material previously contaminated above unconditional release limits as recommended in paragraph 3.7 of Draft American National Standard N13-2.
2. RP-107 does not specifically address determination of pure beta emitting isotopes like strontium-90. Isotopes like strontium-90 and iron-55 are likely to be present in CVCS ion exchange resins and back flush filters.

This point was previously mentioned in NRC Inspection Report No. 50-344/80-16 page 57.

3. RP-107 does not specifically reference the criterion used to purchase or construct strong tight or type A packaging. The licensee builds packaging to MLM-2228, "Certification of ERDA Contractors' Packaging With Respect to Compliance with DOT Specification 7A Performance Requirements". The inspector confirmed by independent measurements that a wooden box to be used for shipping samples conformed to Specification 19B-150 although the box was only required to meet the strong-tight criterion.
4. Although RP-107 states in III.3.A.2.b.9. "If the package is a USNRC approved shipping cask, the specific requirements in the USNRC must be complied with and documented", it does not reference cask specific procedures such as TRP-007 or the requirements of 10 CFR 71.54.
5. OI-T-13 does not reference TRP-006 and if followed, as is, could result in exceeding the burial license free standing water criterion.
6. OI-T-26, states in step 3.3.7.1 to dewater the resins in accordance with TRP-006.

TRP-006 promulgates the procedure to be used in dewatering spent resins that have been transferred into CNSI and Nupac Type 2 liners. This procedure is based on the licensee's tests conducted on July 18, 1980 and January 7, 1981 for the Nupac Type 2 liners and Chem Nuclear Inc. "Dewatering Test Report" (EFO-0246-1). Neither the procedure nor the dewatering test report address factors such as, vibration, freezing and thawing and the effects of other than clean new resin on meeting the acceptance criteria of .5% or one gallon of free standing water on arrival at the burial facility.

Section 9.0, "General Procedure Development" of NRC Inspection Report No. 50-344/80-16 describes the licensee's method of procedure development and implementation. One aspect of the licensee's procedure development and review process not addressed during that inspection involved lower tier procedures and the Plant Review Board (PRB). Technical Specification 6.8, "Procedures" states in part that, "6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

- a. The applicable procedure recommended in Appendix "A" of Regulatory Guide 1.33, November, 1972..."

Technical Specification 6.8.2 states that, "Each procedure and administrative policy of 6.8.1 above and changes thereto, shall be reviewed by the PRB and approved by the General Manager prior to implementation and reviewed periodically as set forth in administrative procedures."

Regulatory Guide 1.33, November 3, 1972, Appendix A, "Typical Procedures For Pressurized Water Reactors and Boiling Water Reactors" lists typical safety-related activities which should be covered by written procedures. The guide specifically states that the appendix is not intended as an inclusive listing of all needed procedures since many other activities that are carried out during the operational phase of nuclear power plants should be covered by procedures not included in that list. Paragraph G. "Procedures for Control of Radioactivity" intended to limit materials released to the environment and personnel exposure specifically mentions solid waste systems including spent resin handling, baling machine operation, and drum handling and storage. Although packaging, shipment, and receipt of radioactive material is not specifically mentioned in Regulatory Guide 1.33 these activities present a potential mode for release of radioactive materials to the environment and possible personnel exposure.

The Radiation Protection Manual, Revision 32 dated April 15, 1981 which is PRB reviewed and approved by the General Manager states in section 2.E.8. that, "All radioactive material shipments shall be made in accordance with 10 CFR 71 and 49 CFR as appropriate. Specific procedures for all shipments are contained in Radiation Protection Procedure RP-107, Radioactive Material Receipt and Shipment."

RP-107, Revision 7 contains 100 pages of information and instruction necessary to package and ship radioactive material in accordance with applicable regulatory requirements. This procedure is reviewed and approved by the Radiation Protection Supervisor. Procedure TRP-003 provides instruction in handling of waste drums, TRP-006 instruction on handling spent resin (dewatering), and TRP-007 instructions on handling and closing certified shipping containers. These three procedures are also reviewed and approved by the Radiation Protection Supervisor, in addition TRP-007 was reviewed by a Quality Assurance Inspector.

Procedures RP-107, TRP-003, TRP-006 and TRP-007 have been established and implemented without PRB review and approval of the General Manager. This represents noncompliance with Technical Specification 6.8 (50-344/81-12-02).

The inspector verified that the USRMC had onsite up-to-date copies of Chapter 10 of the Code of Federal Regulations, Hazards Materials Regulations of the Department of Transportation issued by Tariff No. BOE-600CA and Dat-O-Line, and a copy of U. S. Ecology Inc.'s burial license WN-1019-2 including Amendment No. 14.

The Nuclear Project Quality Assurance Program for Operations, Appendix 2C, "Quality Assurance and Administrative Controls for Packaging Radioactive Material for Transport" describes which

parts of the 10 CFR 50 Appendix B quality assurance plan will be implemented to meet the 10 CFR 71, Appendix E requirement.

A specific training program for all individuals involved in transportation activities has not been documented. RP-122, "Radiation Protection Professional Staff Training" states; that each professional will be trained as directed by the Radiation Protection Supervisor and will receive forty hours per year of retraining. Chemical and Radiation Protection Technicians receive training in shipment of radioactive materials as described by RP-118 and Utility Workers receive the General Employee Radiation Protection Training, RP-110.

b. Implementation

From January, 1980 thru the first calendar quarter of 1981 the licensee delivered radioactive waste to a carrier for transport to the U. S. Ecology Inc. burial facility at Richland, Washington. This material met the low specific activity (LSA) criteria specified in 10 CFR 71.4(g). With one exception, the packaging used consisted of reclaimed steel drums, and wood boxes considered single use, strong, tight containers as permitted by 49 CFR 173.392. One shipment of depleted resin containing 89 curies from the CVCS cation bed was placed in an NRC certified cask for shipment.

The inspector verified that the licensee had onsite a copy of the current NRC Certificate of Compliance for Model Number CNSI-6-80-2. In addition to this documentation the inspector verified that the licensee had registered as a user of this cask on March 26, 1981 as required by 10 CFR 71.12 and had a copy of all documents and drawings referred to in the certificate. The licensee maintains a loose leaf binder (Serial No. 42) supplied by the package owner for the package noted above which contains detailed operating instructions and additional guidance.

Condition No. 27f of burial license WN1019-2 requires that dewatered ion exchange resins have no detectable free-standing liquid. This is defined as less than 0.5%, or one gallon per container, whichever is less. The licensee has used two liners, NuPac Type 2 and CNSI-L4-85R to contain resins. The inspector reviewed the results of the tests conducted in July 1980 and January 1981, by the licensee to demonstrate compliance with this criteria for the NuPac Type 2 liners. These tests did not consider the effects of transportation, e.g. vibration, freezing and thawing as recommended in a letter to "All Power Reactor Licensees", dated January 29, 1980, from Darrell G. Eisenhut, Acting Director, Division of Operating Reactors, Office of Nuclear Reactor Regulation.

The licensee accepted and adopted into their procedures Chem-Nuclear Systems, Inc., "Dewatering Test Report for CNSI Resin Liners, (EFO-0246-1)" to demonstrate compliance with Condition No. 27f.



The liner used by the licensee, CNSI-L4-85R, was described as having a dished or conical bottom with centralized drainage point and retention screen assembly. The report, EFO-0246-1 as presented to the inspector by the licensee did not describe the mesh size of the screen, the effects of vibration, freezing and thawing or a comparison of test results using clean new resin to what might be expected when spent dirty resin is actually used in the liner.

The licensee has not shipped spent nuclear fuel therefore no inspection effort was made to review the licensee's program in this area.

No items of noncompliance were identified in this area.

c. Preparation of Packages for Shipment

During tours of the Auxiliary Building on May 11, 13 and 14, 1981 the inspector observed operation of the waste compactor, preparation, loading, closure and handling of low level radioactive waste. In addition to complying with the requirement of TRP-003 the licensee has recently began use of metal compaction inserts which allow approximately a 100% increase in the amount of waste which can be compressed into the 55 gallon drums. Although use of the inserts is not addressed in the procedure at this time, it is expected that some guidance will be incorporated. The licensee hopes that use of the inserts will result in a 50% reduction in volume of low level radioactive material shipped.

Inspection of several drums about to be filled indicated no major dents or creases, the drum lip was not deformed, gaskets were secured to the lid, and the closure rings were in good condition.

The inspector observed that a quantity of absorbent material is placed in each drum. The filled drums were surveyed, weighed and labeled in accordance with DOT requirements. Independent measurements with NRC portable radiation survey instrument Property No. 008355 indicated agreement with the licensee's survey results.

d. Delivery of Completed Package to Carriers

The inspector reviewed documentation maintained by the licensee regarding the April 7, 1981 delivery of 83 ft<sup>3</sup> of CVCS cation resin containing 89.2 curies of radioactive material in an NRC certified container, (CNSI 6-80-2), to a carrier for transport to the burial facility. The following records were reviewed to determine compliance with regulations expressed in 10 CFR 30.41, 10 CFR 71 and 49 CFR 172 and 173:

- Checklist of Radioactive Material Shipment Requirements
- Radioactive Material Shipment and Receipt Record
- Radioactive Waste Shipment and Disposal Form
- Straight Bill of Lading
- Washington State Certification
- Exclusive Use Statement
- User Check-off Sheet
- CNSI Broker Inspection Record
- Radioactive Material Shipment and Receipt Vehicle Survey
- General Computation Sheet
- Dewatering Data Sheet

From this data review and from discussions with licensee representatives the inspector learned:

When the liner was dewatered in accordance with TRP-006 and less than the expected volume of removed liquid was observed, the licensee opened the liner and discovered water on top of the resin. After consultation with a representative of Chem-Nuclear a one inch plastic pipe was pushed down thru the resin to the retention screen allowing relief of the vacuum condition which apparently developed between the resin retention screen and the centralized drain suction point. The dewatering procedure was then performed with acceptable results.

The licensee representative concluded that following TRP-006 was not sufficient to assure compliance with Condition 27f in this case since the resin used in the design acceptance test was new and did not contain resin fines and other foreign material likely to clog the resin retention screen. The Chem-Nuclear representative indicated that they were aware of this situation.

The licensee did not prepare a nonconformance based on the identified problem.

On June 4, 5, 1981 the inspector discussed EFO-0246-1 with the Director of Regulatory Affairs for Chem-Nuclear Systems Inc. regarding their action relative to the clogging of resin liner retention screens. This representative stated that seven liners had experienced similar problems and the remedial method described above was used to successfully dewater the affected liners. Additionally the mesh size of the retention screen has been modified to preclude recurrence of this situation.

Procedure TRP-007 describes the methods to be used to remove and replace the secondary lid on the CNSI 6-80-2 cask. The "User Check-off Sheet" indicates that critical points of the receipt inspection were performed and documented. The licensee stated that they do not perform maintenance on NRC certified casks.

Step 6.2.2.4i of TRP-007 states: "Seal the cask lid by placing seal wires through the ends of the two (2) adjacent red-painted bolts." Step 6.3 states: "Before the cask leaves the facility, the following shall be confirmed...

(c) That the outer package is sealed with anti-tamper seals." and

Step 6.4 states: "Complete the User Check-Off List and send a copy along with the shipment."

Item 6. "Cask sealed with lead seals" of the "User Check-off Sheet" for the April 7, 1981 shipment had not been initialled as completed. The licensee representatives stated that lead seals were not installed. Since this resin met the LSA criterion of 49 CFR 173.389 the security seal was not required by 49 CFR 173.392 however the failure to follow procedure was brought to the licensee's attention.

Since RP-107 does not specifically address pure beta emitting isotopes the inspector verified by review of sample data that the strontium-90 concentration, (0.0013 uci/gram) was less than the value specified in 49 CFR 173.389(e) which would have required identification on the shipping papers as required in 49 CFR 172.202.

The inspector verified by record review that the torque wrench, Serial No. 1443, used to close the cask had been calibrated on April 7, 1981 prior to use.

No items of noncompliance were identified in this area.

d. Radwaste Training

The inspector reviewed the training provided in the area of 10 CFR 71, 49 CFR 100-199 and burial site requirements for individuals involved in shipping radioactive materials. The USRMC has not yet received any formal specialized training in this area pursuant to RP-12'. He did attend a one hour class on Burial Site Requirements given in November 1980 by the Radiation Protection Supervisor to all CPTs. On-the-job training is continually being provided to the USRMC by the Radiation Protection Supervisor. Other than the required 10 CFR 19.12 training, the cadre of workers processing solid radwaste receive on-the-job training from the USRMC. The inspector confirmed by record review that the eight utility workers had signed the "Plant Operating Manual Revision Information Form" for TRP-003, Revision 0 in the period September 19 - November 12, 1980.

No items of noncompliance were identified in this area.

e. Licensee Audits

The inspector reviewed, "Audit of Radioactive Waste Transport" (GAI-176T-80M) performed November 24-26, 1980. The purpose of this audit was to review and evaluate the adequacy and implementation of the packaging, handling and shipment of radioactive materials. No followup items were identified by the audit.

No items of noncompliance were identified in this area.

4. Radiation Protection During Refueling

The procedures and plans for this refueling outage were examined during the last radiological protection inspection (Report No. 50-344/81-02). The inspector primarily reviewed the implementation of these plans.

a. Planning and Preparation

The inspector observed that sufficient supplies and human resources were available to conduct the work related to the outage. Ample supplies of anti-contamination clothing were stored on the 93' elevation change area and newly decontaminated clothing were received regularly from an offsite contractor. Supplied air bubble suits were kept near the biological shield outside the steam generator access area and in other locations where they were being used. Full face respirators were stored, and issue to trained individuals, at the pocket ion chamber (PIC) office. Portable dose rate survey meters, air samplers and friskers were available at 45' control area access point and at other locations through the plant. All portable instruments examined by the inspectors were within calibration due dates. A technician was assigned full time to calibrate the instruments. The licensee had augmented the radiation protection staff with contract radiation protection technicians provided by Combustion Engineering. The contract radiation protection technician's staff consist of 2 shift supervisors, 48 senior technicians and 16 junior technicians.

No items of noncompliance were identified.

b. Training

On May 12, 1981 an inspector participated in the General Employee Training Program, Prenatal Radiation Exposure Training and Respiratory Protection Training. The General Employee Training Program has been previously described in Inspection Report No. 50-344/81-02.

The Prenatal Radiation Exposure consisted of a commercially prepared video tape and a written handout. The handout is a copy of Regulatory Guide 8.13 and its Appendix. The video tape is consistent with

the guidance in Reg. Guide 8.13. The tape has two intermissions which are introduced by asking the viewer to ask questions at that time. No one from the training staff was present during the intermission to answer any questions that might have arisen. This matter was discussed at the exit interview.

The Respiratory Protection Training consisted of a 30 minute commercially prepared video tape, completing a medical history questionnaire, passing a pulmonary function test using a spirometer and having a proper respirator fit as indicated by a NaCl respirator penetration test booth. The respirator training program appears to meet the training requirements of NUREG 0041 section 8. See other comments under 4.d. Respiratory Protection Program.

The training program as conducted meets the minimum requirements of 10 CFR 19.12.

No items of noncompliance were identified.

c. Exposure Control

Primary personnel radiation exposure monitoring is being conducted with Eberline Thermoluminescent Dosimeters (TLDs). Pocket Ion Chambers (PIC) are used as a backup and to estimate exposures prior to analysis of TLDs. Eberline has personnel on site to analyze the TLDs. Radiation Protection Procedure-RP-109.1, "Exposure Control for Steam Generator Work and Other Jobs Requiring Multiple TLD Issue", described in Inspection Report 50-344/81-02 was observed being used during this inspection. The form "Request for Multiple TLD" was being completed for steam generator workers as well as "Steam Generator Jump Tickets". Individuals preparing to do steam generator entries were observed wearing TLD's on the head, chest and extremities. Discussion with the Radiation Protection Technicians at the steam generator control point indicates that they were aware of the personnel radiation monitoring requirements and were adhering to them.

The inspector reviewed the exposure files of 20 individuals. Records indicate that all 20 individuals had received training pursuant to 10 CFR 19.12. The records indicate that the previous occupational exposure histories were completed. None of the individuals exposure exceeded the limits set in 10 CFR 20.101a and b.

d. Respiratory Protection Program

The licensee's respiratory protection program has been previously described in inspection report 50-344/80-07. The respiratory protection training was discussed in section 4.b. of this report.

Respirator fitting appears adequate although neither procedure RP-113 February 7, 1978 Rev. 0 "Individual Protection Factor Determination for Respirators, Forced Air and Air Hoods" nor the actual movement performed during the fitting test included frowning or running in place which are listed in NUREG 0041 section 8.5.1.2 Simulated Work Conditions. The inspector reviewed recent radiation work permits requiring full face respirators and associated air samples, and 17 "Personnel Contamination Reports" Forms 20A. There were no instances identified where the individuals contaminations could be related to improper respirator fit. The matter of not having all the required movements during the fitting of respirators was discussed at the exit interview and the licensee agreed to review it.

A copy of Procedure RP-104 "Maintenance, Inspection and Repair of Personnel Respiratory Equipment" was posted along with full face respirator blow up diagrams in the area where respirators are cleaned and maintained. Respirators are issued at the PIC office where a list of individuals trained and fitted with respirators is maintained. A respirator was selected by the inspector and examined for proper maintenance. No deficiencies were noted.

The inspector verified that the supplied air hood used by the licensee were marked as meeting NIOSH specification TC-19C-124.

The respiratory protection program of the licensee meets the requirements of 10 CFR 20.103.

No items of noncompliance were identified.

e. Posting and Control

During the tours of the facility the inspectors did not identify any area that was posted incorrectly. Most of the signs had dates in late April and the radiation levels noted on them were comparable to those indicated by the NRC instruments. Large portions of the auxiliary building are accessible without the need for anti-contamination clothing. Reviews of several Radiation Work Permits indicate that dosimetry, protective clothing, respiratory protection and special instructions appeared to be commensurate with the existing conditions. High radiation areas were posted and access controlled by locked doors. According to the licensee representative keys to high radiation area doors are controlled by the shift supervisor and the Radiation Protection Staff. Radiologically contaminated areas are posted and segregated from non-contaminated areas by a step off pad and rope barrier.

During a tour of the Auxiliary Building on May 11, 1981 the inspector entered the Primary Sample Room to perform an independent radiation survey using a portable ionization chamber, NRC Property No. 008985 due for calibration on July 8, 1981 and a portable Geiger-Mueller

survey instrument, NRC Property No. 008355 due for calibration on July 9, 1981. The Primary Sample Room was not locked. The room is posted as a radiation/radioactive materials area consistent with 10 CFR 20.203. In one corner of the room near the ND 4420 the inspector observed a book shelf (TROJ 1173) which contained several small samples labeled as radioactive material and several other containers of liquid and resin which bore no identification or radioactive material label. The inspector surveyed these unlabeled containers and measured 300 mr/hr at contact and 12 mr/hr at one foot from a 50 ml polyethylene bottle containing about 20 ml of liquid and resin. A 250 ml polyethylene bottle containing about 50 ml of liquid read 250 mr/hr at contact and 15 mr/hr at one foot. The licensee representative confirmed these radiation levels with an Eberline R02 survey instrument. Based on information provided by the licensee representative the inspector calculated that the bottles contained about 3.3 and 4.1 millicuries of licensed radioactive material.

The licensee representative pointed out that lying face down on top of the book shelf was a "Caution Radioactive Material Storage Area" sign. The representative flipped the sign up such that it could be read.

10 CFR 20.203(f) requires that unless certain exceptions apply, each container of licensed material must bear a durable, clearly visible label identifying the radioactive contents. The label must contain the words "Caution, Radioactive Material or Danger, Radioactive Material" and sufficient information to permit individuals handling, using, or working in the vicinity of the container to take precautions to avoid or minimize their exposure.

The licensee representative stated that the containers would be labeled. The inspector noted that at the time of this observation individuals could have handled these unlabeled containers and not taken precautions to avoid or minimize their exposure.

Failure to label these containers of licensed radioactive material represents noncompliance with the regulations expressed in 10 CFR 20.203(f) (50-344/81-12-03).

On May 13, 1981, the inspector again toured the Primary Sample Room and noted that a "Caution Radioactive Material" sticker had been placed in the two containers described above. However, these stickers contained no other information. On May 14, 1981 the inspector pointed out to the Radiation Protection Supervisor that the label must also provide sufficient information so that appropriate precautions could be taken. The Radiation Protection Supervisor entered the radiation levels on each sticker.

4. Surveys

The inspector reviewed records for the initial steam generator entry surveys that were conducted on May 1 and 2, 1981 and routine surveys on May 10, 1981. The surveys included measurements for beta and gamma exposure rates, alpha, beta and gamma contamination and particulate and halogen air samples. The inspector selected 10 of the instruments recorded as being used for the surveys and reviewed their calibration records. The instruments' calibration records indicate that all 10 instruments were within calibration due dates and they were acceptable for use as of the last calibration. The records of the surveys included maps of the area surveys in which contamination levels and exposure rates were marked. Attached to the surveys were copies of Form RP-56 "MPC Worksheet".

No items of noncompliance were identified.

5. Review of Trojan Annual Report (Radiological)

The inspector performed an in office review and on site verification of material presented in the 1980 report. The following anomalies were brought to the licensee's attention.

- Tables 2.A-3 and 2.A-14 contain MPC values for iodine-132 which are inconsistent with the values in 10 CFR 20 Appendix A.
- Table 2.A-20 does not contain estimated errors for tritium, dissolved and entrained gases, gross alpha, undiluted and dilution volumes.
- Table 2.B-1, the breathing rate for adults and infants are reversed.
- Table 2.D-1, no dose is reported for waste processing activities.

The anomalies did not result in erroneous conclusions except in the dose reported for waste processing. Here the licensee representative acknowledged that worker confusion on how to correctly record "work codes" on the Radiation Work Permits has resulted in a failure to correctly capture this data. The representative stated that plans are being made to correct this situation.

No items of noncompliance were identified in this area.

6. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on May 15, 1981. The inspector summarized the scope and findings of the inspection.



The licensee representative stressed the administrative nature of the exposure reported in their March 25, 1981 letter and discussed in Paragraph 2 of this report. The inspector responded by stating that the item of noncompliance would be carefully reviewed and classified appropriately considering the severity of the situation.

Aspects of the respiratory protection program and general employee training program as described in Paragraph 4 were brought to the licensee's attention.

The findings of Paragraph 3 regarding transportation of radioactive material were discussed in terms of specialized training, quality assurance/quality control, and procedural adherence necessary to maintain compliance with the complex regulations in this area.